(12) UK Patent Application (19) GB (11) 2 288 419 (13) A

(43) Date of A Publication 18.10.1995

(21) Application No 9407145.3

(22) Date of Filing 11.04.1994

(51) INT CL[6]
E01F 9/047

(52) UK CL (Edition N)
E1G GLN

(56) Documents Cited
EP 0370154 A US 4362424 A

(58) Field of Search
UK CL (Edition N) E1G GLN
INT CL[6] E01F 9/047

(71) Applicant(s)
Benjamin Beveridge
18 North Row, WARMINSTER, Wilts, BA12 9AD, United Kingdom

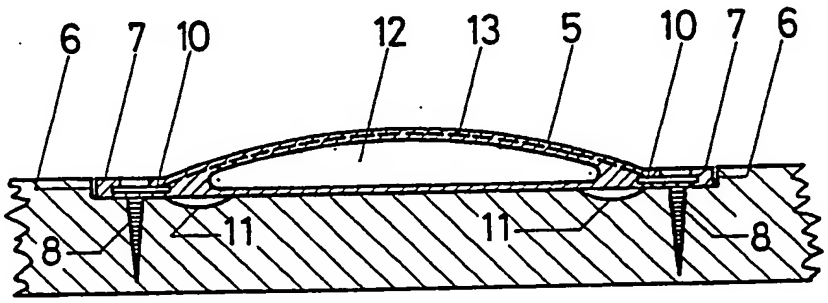
(72) Inventor(s)
Benjamin Beveridge

(74) Agent and/or Address for Service
Benjamin Beveridge
18 North Row, WARMINSTER, Wilts, BA12 9AD, United Kingdom

(54) Deformable speed bump

(57) A method of controlling the speed of vehicles comprises installing deformable speed bumps across the road such that up to a designed control speed, the speed bumps will deform due to the displacement of a fluid within the flexible hollow casing (5), allowing vehicles to pass over them with the minimum of disturbance. As the speed of vehicles increases above the designed control speed, the displacement of the fluid within the speed bump is progressively reduced so that the disturbance to vehicles increases as their speed rises.

Fig. 3.



GB 2 288 419

Fig. 1.

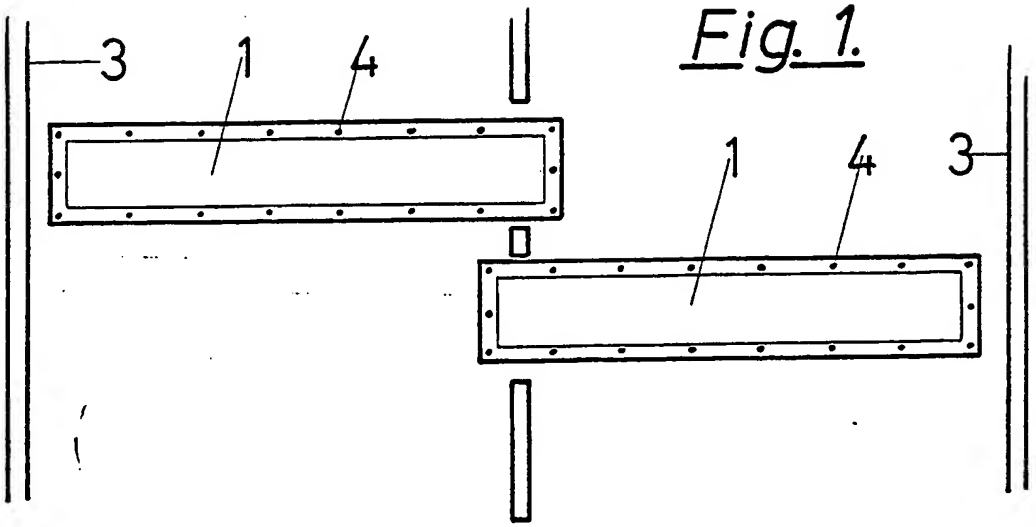


Fig. 2.

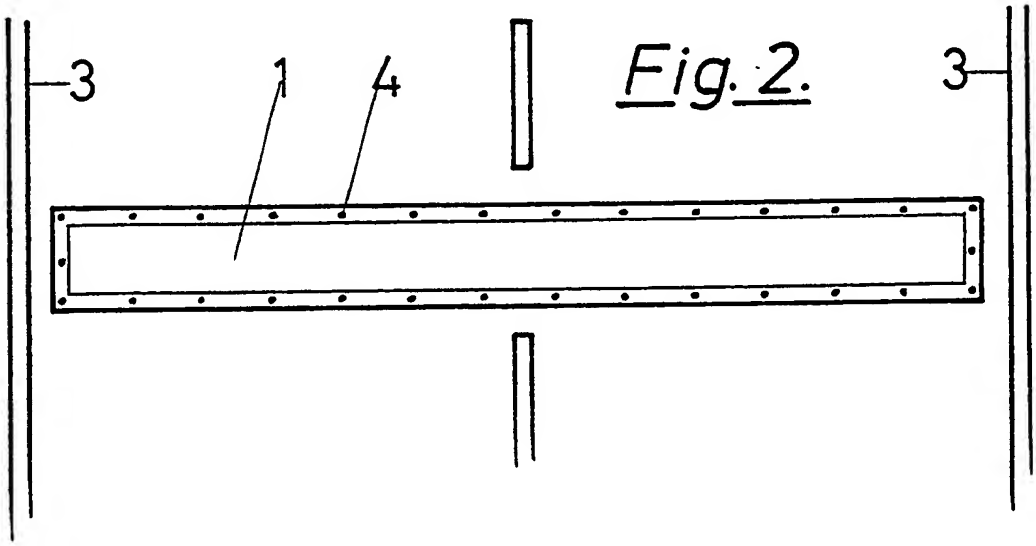
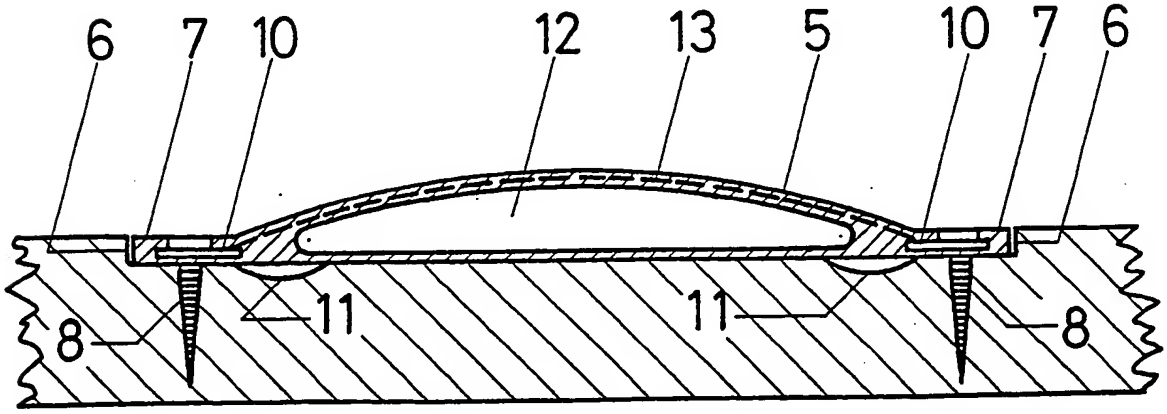


Fig. 3.



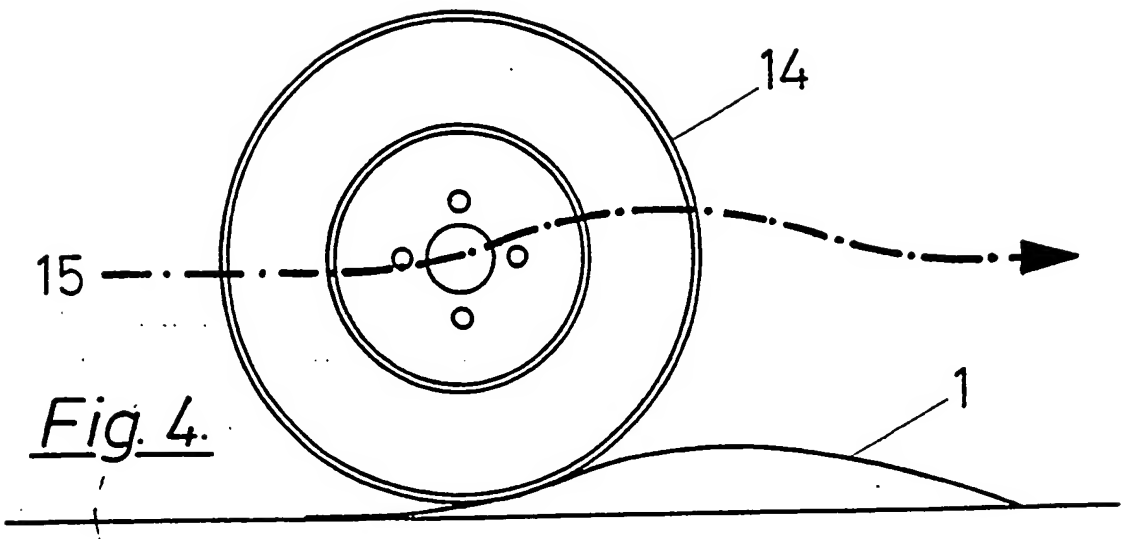


Fig. 4.

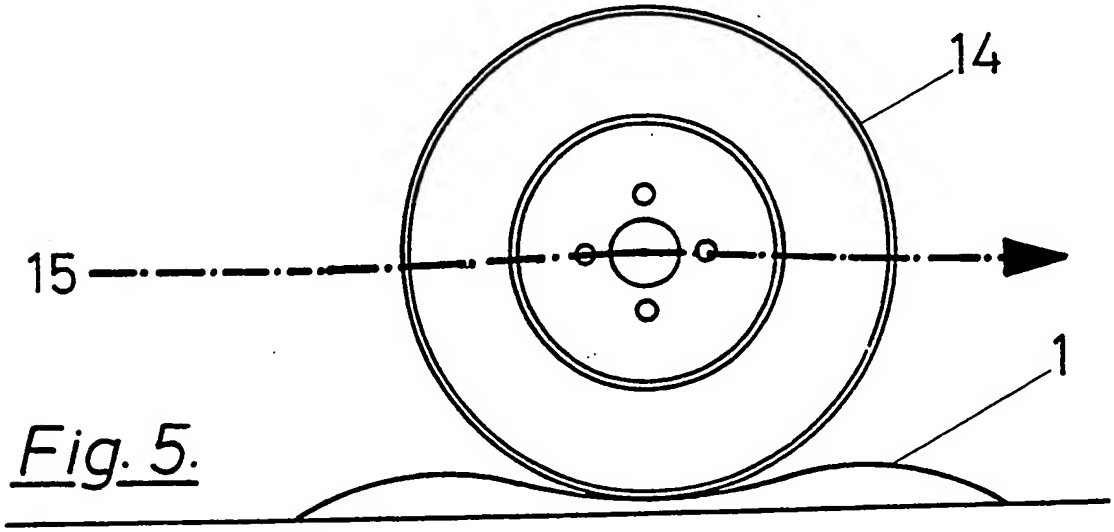


Fig. 5.

2288419

DEFORMABLE SPEED BUMP..

This invention relates to a deformable speed bump.

Speed bumps, or sleeping policemen as they are sometimes called, have been accepted as an effective method for forcing drivers of wheeled vehicles to reduce speed in selected areas for safety or other reasons.

Speed bumps are typically laid across a roadway such that any vehicle passing along that roadway is obliged to pass over them. The width of the bump together with it's height above the surface of the roadway determines the practical and safe speed at which an average vehicle can pass over it. This can also be partially determined by the angle of the ramp leading from the roadway to the crown of the bump and leaving the crown back onto the roadway.

Speed bumps are made in a number of different ways. They can be formed from an aggregate/bitumen mixture, brick or stone or from pre-formed blocks of hard rubber or similar composite materials laid across the roadway and secured to the roadway by screws or other means.

All of the current methods of forming speed restricting bumps across roadways can be designed to give the desired degree of speed restriction by altering the principle dimensions of height above the roadway surface, width of the bump over which the vehicle has to pass and the angles of the approach and departure ramps.together with the number of bumps per mile.

The overall effect of installing speed bumps on a section of roadway is to reduce or regulate the average speed of vehicles over that section of roadway.thus fulfilling it's designed purpose. The installation of speed bumps also has a number of disadvantages; increased noise and pollution as vehicles brake before reaching the bumps, change gear while negotiating the bump and accelerating between the bumps; increased wear and tear on vehicle braking, suspension and transmission parts. Particularly affected by the installation of speed bumps are

negotiate speed bumps as fast as possible in the performance of their duties. The serious delay to their progress caused by speed bumps can have dangerous consequences.

This invention aims to allow the installation of speed bumps which will effectively control the speed of vehicles without the need for vehicles to reduce their speed below the designed control speed while crossing over the deformable speed bumps.

This is achieved by means of a flexible hollow shaped tube securely fixed to the road surface and square to the vehicle flow. The tube may be filled with a porous matrix impregnated with a suitable fluid such that when the wheels of a vehicle strike the tube, the fluid can be dispersed away from the contact area of the wheels but contained within the sealed hollow tube. The rate of dispersion of the fluid away from the wheel contact area is controlled by the viscosity of the fluid and the porosity of the matrix. These variables can be adjusted in manufacture to tune the rate of dispersion to suit the designed speed rating of the deformable speed bump. By way of example, the deformable speed bump can be designed to allow a comfortable speed of 20mph. over the bump but which will become increasingly less deformable as vehicle speed increases until it effectively becomes almost solid at 30 mph. In this example, it would allow a comfortable traffic flow rate of 20 mph. without the need for vehicles to slow for the individual bumps.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:-

Figure 1 shows two overlapping deformable speed bumps.

Figure 2 shows a single deformable speed bump.

Figure 3 shows a cross section of the deformable speed bump.

Figure 4 shows a vehicle wheel approaching a speed bump.

Figure 5 shows a vehicle wheel in the centre of a deformable speed bump.

Refering to the drawings, Figure 1 shows a plan view of a typical installation of deformable speed bumps on a road where the speed bumps (1) overlap the centre line of the road (2) such that vehicles using the road between the kerbs (3) are obliged to pass over the deformable speed bumps (1). which are securely fixed to the road surface by a series of screws (4) or by some other means.

Figure 2 shows a single deformable speed bump (1) running between the kerbs (3) such that vehicles using the road are obliged to pass over the speed bumps.

Figure 3 shows a typical cross section of a deformable speed bump set into a cut away section of roadway where the sealed flexible hollow tube (5) is seated in a recessed section (6) cut from the roadway surface such that the bottom surface of the flexible section (9) is lower than the top surface of the roadway and that the top edges of the peripheral flange (7) are flush with the surface of the roadway to allow a smooth transition from road to speed bump for wheeled vehicles. The peripheral edges, or flanges (7) are secured to the cut away section of the roadway (6) by screws, bolts (8) or other means such that the bottom surface (9) of the flexible hollow tube (5) retains close proximity to the cut away section of the roadway (6). The screws (8) or other means of securing the peripheral flange (7) to the cut away section of the roadway (6) will pass through the peripheral flange (7) which may be re-inforced by a moulded-in longitudinal strip (10) of metal or other material. The reinforcing strips (10) may be bonded to the flange (7) or moulded into the flange in long strips or in shorter sections to provide the necessary integrity of the fixing method employed. The cut away section of roadway (6) may also include sections of deeper cuts (11) to allow for deflection of sections of the flexible tube (9) when wheeled vehicles pass over it.

The cavity (12) running the length of the tube may be filled, or partially filled, with fluid or gel, either on it's own, or in combination with a porous flexible matrix, depending

The cavity (12), after the liquid or gel has been introduced into the cavity via a valve or opening, typically at one end of the tube, is sealed such that it will contain any increase in internal pressure caused by the effect of vehicle wheels, or other external pressure, acting upon the tube. The flexible casing of the spped bump (5) may incorporate one or more reinforcing layers (13) of flexible metal or other material to provide the necessary resistance to impact, pressure, wear or perforation.

Figure 4 shows a schematic wheel and tyre (14) travelling from left to right at a speed in excess of the designed speed which would allow the speed bump (1) to deform. At this excess speed the wheel is obliged to follow a path (15) roughly parallel to the surface configuration of the un-deformed speed bump causing a noticable disturbance to the vehicle suspension and therefore discomfort to the vehicle occupants.

Figure 5 shows a schematic wheel and tyre (14) travelling from left to right at a speed below the deformable speed of the speed bump (1) so that the wheel is able to follow a relatively undisturbed path (15) which would cause very little disturbance to the vehicle suspension or the vehicle occupants.

CLAIMS.

1. A deformable speed bump for the purpose of calming or controlling the flow of vehicular traffic along a given route.

2. A deformable speed bump as claimed in Claim 1 wherein a flexible casing is secured to the surface or sub-surface of the roadway such that the wheels of vehicular traffic using that roadway are obliged to pass over the flexible casing.

3. A deformable speed bump as claimed in Claims 1 & 2 wherein the flexible casing contains a fluid or gel sealed within the flexible casing.

4. A deformable speed bump as claimed in Claims 1 to 3 wherein the fluid or gel sealed within the flexible casing may impregnate a porous matrix sealed within the flexible casing.

5. A deformable speed bump as claimed in Claims 3 & 4 wherein the viscosity of the fluid or gel may be so arranged to give the required rate of dispersal when a vehicle passes over the flexible casing to offer the required interference to the vehicle according to the vehicle speed.

6. A deformable speed bump as claimed in Claims 4 & 5 wherein the porosity of the porous matrix, if included, may selected to give the required rate of fluid or gel dispersal to allow the speed bump to give the necessary resistance to vehicular traffic as the speed of that traffic rises.

7. A deformable speed bump as claimed in Claims 1 to 6 wherein the cross section profile of the flexible casing will conform to the requirements of the Department of Transport.

8. A deformable speed bump as claimed in Claims 1 to 7 wherein a wheeled vehicle may pass over the flexible casing with minimum disturbance at low speed due to the dispersion of the fluid or gel within the flexible casing and the subsequent deformation of the flexible casing.

9. A deformable speed bump as claimed in Claims 1 to 7 wherein a wheeled vehicle may pass over the flexible casing with maximum disturbance at high speed due to the inability of the fluid or gel to disperse within the flexible casing and the subsequent inability of the flexible casing to deform under the wheels of the vehicle passing over it.

10. A deformable speed bump substantially as described herein with reference to Figures 1 to 5 of the accompanying drawings.

Patents Act 1977 Examiner's report to the Comptroller under Section 17 (The Search report)	Application number GB 9407145.3
Relevant Technical Fields (i) UK Cl (Ed.N) E1G (GLN) (ii) Int Cl (Ed.6) E01F 9/047	Search Examiner D HAWORTH Date of completion of Search 17 MAY 1995
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii)	Documents considered relevant following a search in respect of Claims :- 1-10

Categories of documents

X:	Document indicating lack of novelty or of inventive step.	**P:**	Document published on or after the declared priority date but before the filing date of the present application.
Y:	Document indicating lack of inventive step if combined with one or more other documents of the same category.	**E:**	Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A:	Document indicating technological background and/or state of the art.	**&:**	Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	US 4362424 A	(BARBER)	1-10
X	EP 0370154 A	(MAREAN)	1-10

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journ